Preface

Many real-world problems arising in engineering, economics, medicine and other domains can be formulated as optimization tasks. Every day we solve optimization problems. Optimization occurs in the minimizing time and cost or the maximization of the profit, quality and efficiency. Such problems are frequently characterized by non-convex, non-differentiable, discontinuous, noisy or dynamic objective functions and constraints which ask for adequate computational methods.

This volume is a result of very vivid and fruitful discussions held during the Workshop on Computational Optimization, WCO-2014. The participants agreed that the relevance of the conference topic and quality of the contributions clearly suggest that a more comprehensive collection of extended contributions devoted to the area would be very welcome and would certainly contribute to a wider exposure and proliferation of the field and ideas.

The volume includes important real problems like parameter settings for controlling processes in bioreactor and other processes, resource constrained project scheduling, infection distribution, molecule distance geometry, quantum computing, real-time management and optimal control, bin packing, medical image processing, localization the abrupt atmospheric contamination source and so on.

Some of these problems can be solved applying traditional numerical methods, but others need a huge amount of computational resources. Therefore, for them it is more appropriate to develop algorithms based on some metaheuristic method like the evolutionary computation, ant colony optimization, constrain programming, etc.

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